OCR Computer Science A Level
1.1.1 Structure and Function of the Processor

Flashcards

What does the Arithmetic and Logic unit do?

What does the Arithmetic and Logic unit do?

The ALU completes all the arithmetical and logical operations.

What is the Control Unit?

What is the Control Unit?

A part of the processor which directs operations inside the CPU.

What are registers?

What are registers?

Small memory cells that operate at high speeds.

Where do all the arithmetic, logic, or shift operations occur?

Where do all the arithmetic, logic, or shift operations occur?

They occur in registers.

What does the Program Counter (PC) do?

What does the Program Counter (PC) do?

The Program Counter holds the address of the next instruction.

In which part of the CPU do all calculations take place?

In which part of the CPU do all calculations take place?

The Arithmetic and Logic Unit (ALU).

Where are intermediate arithmetic and logic results stored?

Where are intermediate arithmetic and logic results stored?

In the accumulator (ACC).

What does the Memory Address Register do?

What does the Memory Address Register do?

Holds the address of a location that is to be read from or written to.

What does the Memory Data Register do?

What does the Memory Data Register do?

Temporarily stores the data that has just been read from or the data needs to be written.

What does the Current Instruction Register do?

What does the Current Instruction Register do?

Holds the current instruction divided up into opcode and operand.

What is a Bus?

What is a Bus?

A set of parallel wires connecting two or more components together.

What is the system bus?

What is the system bus?

The collection of the data bus, address bus, and control bus is called the system bus.

What is the width of a bus?

What is the width of a bus?

The number of parallel wires it has.

What is the data bus?

What is the data bus?

A bidirectional bus used to transport data and instructions between components

What is the control bus?

What is the control bus?

The bi-directional bus used to transmit control signals between internal and external components.

What is the address bus used for?

What is the address bus used for?

Used to transmit the memory address specifying where data is to be sent from or retrieved from.

What does adding a wire to the address bus do to the number of addressable locations?

What does adding a wire to the address bus do to the number of addressable locations?

It doubles the number of addressable locations

What does the Bus Request indicate?

What does Bus Request indicate?

indicates a device is requesting access to the data bus.

What does Bus Grant indicate?

What does Bus Grant indicate?

Indicates the CPU has granted access to the data bus.

What does memory write do?

What does memory write do?

Causes the data on the data bus to be written into the addressed location

What does memory read do?

What does memory read do?

Causes the data from the addressed location to be placed onto the data bus.

What does the interrupt request control signal indicate?

What does the interrupt request control signal indicate?

Indicates that a device is requesting access to the CPU.

What is the clock control signal used for?

What is the clock control signal used for?

It is used to synchronise instructions.

What is Assembly Language?

What is Assembly Language?

Assembly Language is a programming language where mnemonics are used to represent instructions.

What is opcode?

What is opcode?

Opcode is used to determine the type of instruction and what hardware to use to execute it.

What is the operand?

What is the operand?

The operand is the address of where the operation is performed.

What occurs during the fetch phase?

What occurs during the fetch phase?

- The address from the PC is copied to the MAR,
- Instruction held at that address is copied to the MDR by the data bus, simultaneously the contents of the PC is increased by 1,
- The value of the MDR is copied to the CIR

What occurs during the decode phase?

What occurs during the decode phase?

The contents of the CIR is split into operand and opcode.

What occurs during the execute phase?

What occurs during the execute phase?

The opcode is executed on the data.

What is the clock speed?

What is the clock speed?

The number of clock cycles completed per second.

What is cache memory?

What is cache memory?

Cache memory is the CPU's onboard memory which can be accessed a lot faster than main memory

What is pipelining?

What is pipelining

The process of completing the fetch, decode and execute of three separate files simultaneously.

What is Von Neumann architecture?

What is Von Neumann architecture?

Architecture in which there is a single shared memory and shared data bus for both data and instructions.

What is Harvard architecture?

What is Harvard architecture?

Architecture in which there is two separate memory and data buses for data and instructions.

What is contemporary processing?

What is contemporary processing?

Processing in which Von Neumann architecture is used for main memory. Cache uses Harvard architecture, divided into instruction cache and data cache